

Using the Discriminant to Find the Number of Solutions of Quadratic Equations

Use the discriminant to determine how many solutions a quadratic equation will have.

If the discriminant is **positive**, the equation has **2** solutions.

If the discriminant is **zero**, the equation has **1** solution.

If the discriminant is **negative**, the equation has **no real solutions**.

To find the discriminant, make sure the equation is in the form $ax^2 + bx + c = 0$.

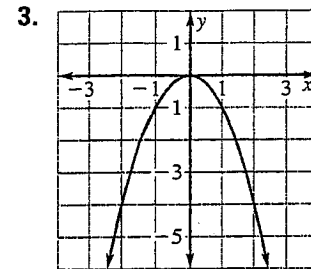
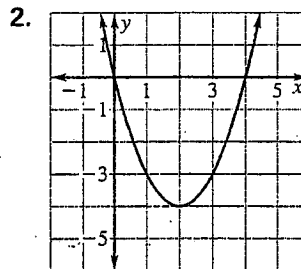
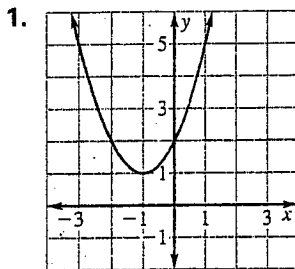
Calculate the value of $b^2 - 4ac$.

Match the discriminant with the graph.

A. $b^2 - 4ac = 3$

B. $b^2 - 4ac = 0$

C. $b^2 - 4ac = -2$



Decide how many solutions the equation has.

4. $x^2 + 6x + 10 = 0$

5. $x^2 + 8x + 16 = 0$

6. $3x^2 - 5x + 2 = 0$

7. $x^2 - 6x + 9 = 0$

8. $9x^2 - 6x + 1 = 0$

9. $15x^2 + 2x + 16 = 0$

10. $x^2 + 4x - 12 = 0$

11. $-x^2 + 16x + 64 = 0$

12. $3x^2 + x - 1 = 0$

13. $2x^2 + 7x + 50 = 0$

14. $2x^2 + 3x + 1 = 0$

15. $-3x^2 - 2x - 7 = 0$

Decide how many solutions the equation has.

1. $x^2 + 2x + 1 = 0$

2. $-2x^2 + 5x + 3 = 0$

3. $x^2 + 4x - 2 = 0$

4. $x^2 + 2x + 6 = 0$

5. $2x^2 + x - 15 = 0$

6. $-\frac{3}{2}x^2 + 2x + \frac{1}{2} = 0$

7. $x^2 - \frac{1}{2}x + 8 = 0$

8. $\frac{4}{3}x^2 + 4x + 3 = 0$

9. $-25x^2 + 10x - 1 = 0$

10. $-12x^2 + 19x - 5 = 0$

11. $6x^2 + 25x + 21 = 0$

12. $3x^2 - 5x + 4 = 0$

Decide how many solutions the equation has.

1. $x^2 + 12x + 32 = 0$

2. $3x^2 + 5x - 2 = 0$

3. $5x^2 - 8x + 9 = 0$

4. $2x^2 - 12x + 18 = 0$

5. $-2x^2 - 5x - 6 = 0$

6. $x^2 - 2x + \frac{1}{3} = 0$

7. $-\frac{7}{2}x^2 - 4x - 5 = 0$

8. $\frac{3}{2}x^2 - 3x + \frac{3}{2} = 0$

9. $-5x^2 - x + 1 = 0$

10. $-2x^2 + 3x - 1 = 0$

11. $18x^2 - 11x + 2 = 0$

12. $-3x^2 + 12x - 12 = 0$

Extra Practice**9.4**

Name _____

Extra Practice

In 1-12, use the quadratic formula to solve the equation.

1. $x^2 - 8x + 15 = 0$

2. $x^2 + 11x + 18 = 0$

3. $2x^2 + 3x - 2 = 0$

4. $4x^2 - 7x + 3 = 0$

5. $8x^2 + 26x - 15 = 0$

6. $x^2 + 3x - 5 = 0$

7. $x^2 - 7x + 1 = 0$

8. $3x^2 + 8x + 2 = 0$

9. $3x^2 + x - 6 = 0$